

**GEOLOGY AND
AGRICULTURE
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There is no science so instructive, and, at the same time, so amusing as Geology. It is not only instructive and amusing but it is also profitable. By possessing a proper knowledge of the component parts of different soils the agriculturist improves his lands, making them produce crops which his more ignorant neighbour in vain tries to emulate. The scientific farmer knows when and where to drain, to irrigate, and to manure. He also knows the crops which are adapted to each kind of soil, and he understands moreover when the land should be allowed to repose — a grand secret in agricultural matters. His knowledge, besides, tells him what sort of manure he must adopt to each description of land, — modified occasionally according to the season of the year, the climate of the country and the crop he intends to produce. Agriculture, so

intimately connected with Geology and Chemistry, has, in some countries, become a true science. This science is cultivated in England perhaps more than anywhere else.

Its value however is becoming gradually understood — in France, for instance, in Belgium and in the United States. Italy it must be confessed is behind hand, and it is a great pity. What country of Europe has a finer climate and a richer soil? The Italians too are not wanting in industry, and amongst them are to be found men of the greatest scientific attainments. The chemists of Italy are preeminent. Let these learned men apply their talents to the good of their country. It is no exaggeration to say that, were the riches of the Italian soil properly developed, the revenue to the government could be easily doubled. Knowledge it is said is power. It is not only power, but happiness. It is happiness in this world, and will surely be the cause of happiness in the next. Let those, I repeat, who have knowledge impart it to others for the general good. Italy in time will no doubt advance in Agriculture as she has advanced in every other science. Her unsettled state has hitherto impeded her progress in this respect, because, for the proper developement of a country, having regard to the culture of the soil, a period of profound peace is necessary. This period has now happily arrived, and the time is not far distant when this fine country will no longer have to groan under the weight of a

taxation, which under favorable circumstances would not be by any means exorbitant and which in a few short years will be considered extremely light, but at present, in consequence of the wretched state of the peasantry, is indeed a heavy load.

The peasants, of themselves, cannot improve their condition; they require instruction. It is wonderful what can be done by way of example. A few model-farms here and there have worked wonders in England.

The Government, aided by men of science, should give their attention to this. It is not necessary to say that the duty of a government does not consist only in levying taxes and enforcing the payment thereof. The first duty of a government is to help, by every means in its power, the people to supply the expenses necessary for carrying on the business of the country. In what way should the government afford this assistance? There is only one answer to this question: By giving every facility and instruction for the developement of the resources of the country. There are schools of philosophy, of Architecture, of Music, of painting &c., why not schools of practical geology in connection with farming? It is evidently the paramount duty of the government to encourage agriculture on an improved method. The mineral resources of the country should also be ascertained and developed. Agriculture is more attended to in Piedmont than perhaps in any other part of Italy; but, although

Sardinia abounds in mountains, mining is little practised and the mineral wealth of the country, notwithstanding that it is believed to be great, has never been ascertained. In those parts of Italy where the principal occupation of the people is Agriculture, it is allowed on all hands, that it is not skilfully conducted. The finest statuary marble in the world is found at Carrara in inexhaustible quantities, but the quarries are not worked to the extent that they might be. There is still another article, connected with Geology, by which enterprising men in other parts of the world, more especially in America, have made fabulous fortunes. — I mean Petroleum. In the United States of America men easily associate in speculative undertakings; capital is freely applied, and, when necessary, government assistance is obtained without much difficulty. In Italy however, and indeed in most countries of Europe lately, it is extremely hard to find capitalists willing to engage in any undertaking however promising. The consequence is that one of the most valuable commodities that the earth produces is left to lie idle. That by which thousands of Americans have become wealthy beyond their wildest dreams, and by which the Nation has added immensely to its riches, is neglected and scarcely thought of in Italy.

On the shores of the Red Sea not far from Suez there are bituminous springs which it is said are going to be worked by a company formed under the auspices of the Viceroy of Egypt. What is done

in Egypt under a despotic government could surely be done much more securely in Italy under a free and enlightened government. Besides, these springs cannot be said to produce petroleum properly so called, but rather a sort of earthy tar, (from which however it is probable that oil may be obtained) whereas the Italian springs are of the very best description and equal in quality to the famous rock oil of America.

In reference to Agriculture I have said that the grand secret is to know when to allow the land to repose. A striking proof of this is in the fact that, in Egypt, where the best cotton in the world (except the American Sea-Island) is grown, the land has become so impoverished by the yearly cultivation of the cotton plant, it is feared that this valuable fibre will gradually disappear from the country, or at all events become so deteriorated as to be good for nothing. Three years ago the quality of the Egyptian cotton was excellent in every respect, and the average quantity produced per fedan was 7 cantars. This year the article is much inferior, and, extraordinary to relate, the average produce is only three cantars per fedan. This is to be attributed *solely* to the fact of the Fellahs sowing cotton three consecutive years in the same land, because the Nile arose at the proper time and to the proper height, and the weather was all that could be desired, neither too dry nor too moist and without heavy dews. The Egyptian Agriculturists labour under a greater

disadvantage than their European brethern. They are not only ignorant to the last degree, but they consider it almost a sacred duty to adhere to the customs of their fore-fathers. The consequence is that they still make use of the primitive wooden plough, which it is said was in use 3000 years ago.

This plough barely scratches the surface of the earth, and the true richness of the soil, which lies deeper down, is never disturbed or made use of. An English gentleman was once seen by an Arab sheikh to examine a handful of sand on the banks of the Nile. The Arab asked him what he saw in the sand to gaze at so intently. 'I am trying to find out' replied the Englishman, who was a Geologist, 'what the soil of the Delta is composed of.' 'Well, what good will that do you?' Asked the Arab. 'It will not perhaps do me much good' said the other, 'but, as I intend writing something on the subject, which will be published, it may do some good to Egypt.' 'Ah you Franghis are always giving us advice! And what is your particular idea about the soil?' 'My idea is that, to get good crops, you must dig deeper as we do in Europe. You must not depend altogether on the overflowing of the Nile, and scratching the surface with a pointed stake.' He then related to him the story of the husbandman who being at the point of death called his sons to his bed-side and informed them that there was a treasure hidden in his farm for which they must dig after his death. The sons dug up

the farm as it had never been dug up before, but they did not find the treasure that they expected. Their crops however that year were the wonder of the country round, and then they understood the wisdom that dictated the last words of their dying father. The Arab sheikh shook his head and laughed. He has not improved on his plough yet.

The two sciences of Geology and Chemistry practically applied to farming, as I have said, will tend to improve a country perhaps more than anything else. The science of Geology in particular has been the means of discovering endless mines of gold. It is pretty generally known that, where the most ancient rocks, (called igneous) those which are supposed to be formed by the action of heat and pressure in the centre of the earth, such as granite, porphyry, quartz &c., force their way upwards through the oldest of the Aqueous deposits, that is to say, stratified rocks deposited by water, such as limestones, clay slates, sandstones &c., and especially if the igneous rocks form ranges of mountains pointing from north to south, there gold may be almost certainly found. It was the knowledge of this Geological fact which led to the discovery of gold in Australia, and in many other places. As I have however already intimated the most important matter to which Geological knowledge should be applied is Agriculture, because no nation can be rich or prosperous where this is neglected. We have examples in Greece, Turkey, Spain, Portugal,

and some other countries which it is not necessary to mention. Geology should be also practically applied in ascertaining the mineral wealth in mountainous districts, and above all where Petroleum exists, as in Italy, it ought to be put to use and the advantages derivable from so valuable an article of commerce secured without delay.

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